The Starry Messenger and the Assessment of Liberal Education

Galileo's *Starry Messenger* is a useful propaedeutic for how to think about assessment of liberal education. Why? Galileo's work is on the cusp of modern science. The *Starry Messenger* is part of Galileo's considerable effort to model a transition in scientific thought, and it is patently meant to address earlier modes of thinking. As such, Galileo's work is unusually clear, even outspoken, about its aims, methods, and most importantly, the kind of discussion that this work should become a part of. Of equal importance is Galileo's methodical awareness that what he is talking about, the starry heavens, is a scene of possibility, not just demonstrable certainty. I wish to argue that physical and hypothetical possibility is, in fact, Galileo's main concern in this treatise. As we begin to bring science-inspired tools of measurement to liberal education, we would profit by looking carefully at this early scientific work. For much as Galileo helped to reform and reshape physics, so our efforts in assessment may do the same to liberal arts. The most important question, therefore, that we should attend to is this: What possibilities are we leaving to ourselves as we embark on this new educational journey?

Galileo worked on the book up to the point of printing, yet the work's structure and intent are carefully crafted, not only to deliver the four discoveries – of the moon's roundness, of the unfathomable number of stars, of the nature of nebulae, and of the existence of the four Jovian moons – but to lay out real possibilities of what the universe contains. Galileo's proofs build a frame for a picture of what the universe may be like. The proof of the roughness of the moon concerns the nearest celestial object. Next come the stars, the most remote points of light. Among these, Galileo first distinguishes between the magnified images of fixed and wandering stars: "the fixed stars are never seen to be bounded by a circular periphery" while the planets "show their globes perfectly round and definitely bounded, looking like little moons" (Stillman, 47). After the frame is set, into it moves Jupiter with (at first) three never-before-seen "starlets," which attract Galileo's notice because all four objects are in a line. The next night Galileo notices the alignment has changed sufficiently so that he "commence[s] to wonder whether Jupiter was not moving eastward at the time contrary to the computations of the astronomers" (52). However, the clinching proof that these are moons turns out to be that Galileo can measure their and Jupiter's movements against a fixed star in the telescope's view. The movements of this system accord exactly with "the movements derived from the planetary tables" for Jupiter (56). It is here where the main argument turns from the "certainty of evidence" to culminate in discussing possibilities in the universe:

> Here we have a fine and elegant argument for quieting the doubts of those who, while accepting with tranquil minds the revolutions of the planets around the sun in the Copernican system are mightily disturbed to have the moon alone revolve around the earth and accompany it in an annual rotation about the sun. Some have believed this structure of the universe should be rejected as impossible. But now we have not just one planet rotating around another … [but] our own eyes show us four stars, which wander around Jupiter (57).

While there is no doubt that Galileo's deliberate method was designed and aimed to foreclose some of "the disputes that have vexed philosophers through so many ages [and, thus, to leave them] freed from wordy debates," the larger purpose of Galileo is to raise hypotheses for

criticism and further investigation (49). The nature of the universe is only the grandest of these. Seas on the moon, an atmosphere on it, and an atmosphere for Jupiter are three other hypotheses that we can say, on the basis of his evidence, might be true. Repeatedly, Galileo invites "the judgment and criticism of thoughtful men" – in other words a discourse – and all of this is part of his larger invitation to those "who are eager for true philosophy to the first steps of such important contemplations" from which he fully expects that "perhaps other things, still more remarkable, will in turn be discovered" (28).

If this work has something to say to us as we embark on assessment of liberal education, I think it is well to remember that measurement is, literally, the last thing Galileo is concerned with. Possibility, proof of existence and qualities, and open-minded critical discourse about nothing less than the universe precede his concern with measurement that, while essential, serves these larger purposes.

As we make the transition between an old way of thinking about liberal education to, at least, the employment of a new way, we must leave room for both what the universe of liberal education might possibly be and what is possible in it. If all our instruments allow us to do is to prove effectiveness in the achievement of liberal education, then we will have proven the achievement of already established goals. Satisfied with this, we may foreclose both our past and our future, or, conversely, leave our assessment findings unconnected to our thinking about what liberal education might be.

Hence, procedures and processes which encourage speculation about the nature of liberal education and which tie that speculation to the evidence of liberal education – in the curriculum, its texts, and in evidence of student learning – are essential to any assessment that would be useful to liberal education.

The American Academy for Liberal Education (AALE) has recently developed, under a Pew Knight project, an accreditation procedure in the liberal arts that is grounded in assessment. Like our institutional instruments, the AALE "Liberal Learning Assessment Standards" aim to set goals for liberal education. One in particular, the "Inclination to Inquire," seems to me to address the notion of possibility within liberal education which, I think, is essential to it:

> An education in the liberal arts and sciences … fosters the student's desire for seeking out and acquiring important knowledge and skills. For this reason, disposition for asking incisive and insightful questions and for pursuing enriching and useful knowledge and skills is perhaps the surest sign of a liberally education mind (AALE, "Standards).

I think Eva Brann helps us to fill out both the import and means of inquiry. Attending to the import and reserving the means for later, we see Brann writes that a

> genuine question is … above all *a directed desire of the intellect.* When addressing a human being, it is a demand for the communication, the sharing of truth. When addressed to things, it serves notice that the world is held responsible, that is thought to be able to answer … to be endowed with reasons (143, author's emphasis).

Such a goal for education, *a directed desire of the intellect to learn what a liberal education might be* is a proper goal of assessment *and, therefore, of a liberal education program itself.* If one could find evidence of achievement of this desire in student products and activities, that evidence might stimulate a conversation with faculty while an accreditation site visit team using these guidelines and evidence was on campus. But accreditation is, properly, an external review of the achievement of institutionally-generated mission and goals, so the real problem is how might the process of examining the possibilities inherent within liberal education, even about what liberal education might be, be internalized to the institution itself.

Ball State University seems to have begun that internalization. A participant in the AALE (now ACTC) project "Assessing Trends in the Liberal Arts Core," Ball State very early in the last decade recognized the implication that assessment should address the nature of liberal education and Ball State tied its general education program to those implications. The impetus for instituting a review process arose when faculty members concerned with the Program of General Studies realized that they had no way of knowing whether a 1986 reform structure was meeting goals for general education that had been adopted by the faculty. A plan of review was adopted to evaluate whether each course was performing as it should in light of the goals. I will not describe this set of procedures except to say that it lasted over three years and, at least, brought into question courses that seemed to have little relation to the goals of the general education program. Subsequently, Tom Lowe, the dean of Ball State's University College, began to set up summer seminars and workshops involving about twenty faculty members to talk about goals in light, partly, of the data coming out of the assessment process described above. One of the main goals of the program was to produce an "educated person," and faculty had been frustrated by the goal and kept asking what it meant. Eventually, the summer seminars and workshops resulted in an elaboration of specific goals to help determine the meaning of the phrase for Ball State. During 2000 and 2001 academic years, the general education committee was looking at how the entire structure of general education and its courses could be constructed in order to graduate from Ball State with a baccalaureate degree. What matters here, most of all, are not the specific goals but the generation of them by a process of reflection upon the curriculum over the meaning of one of its cardinal notions.

How, then, might measurement of student learning enter into the conversation to support a speculative, yet substantive, conversation about liberal arts on a continuous basis? For Brahn, the process of inquiry attached to a genuine question deeply involves a process of "reading the written tradition" which "encompasses all the way of paying attention to texts." I would suggest that the liberal arts tradition of core texts provides innumerable works that link speculation about liberal education to technical measurement. I am thinking of works like the *Phaedrus,* the *Gorgias*, Plato's *Republic* (particularly those parts actually focusing on education's functions, structures and arts, 332D-378A and 511A-534E); Aristotle's *Topica* and *Sophistical Refutations,* and the last book of the *Politics*; Cicero's *De Inventioni,* Hume's "Standard of Taste," Reynold's *Discourses on Art* and, possibly, Sontag's *Against Interpretation.* All of these contain a combination of speculation about the liberal spirit and the technical means to analyze the acquisition of the liberal arts. As a faculty charged to assess, we need to read and use works like these in our discussions both to judge whether we are approaching a liberal education *and to construct the instruments we would use to know it.* These works provide *topoi* that are useful to discerning both what our purposes are and, in instruments of assessment of student products and

activities, whether our students can exercise the liberal arts sufficiently to join in inquiry. I would further suggest that the point at which such texts might actually become a part of a continuous process of liberal education review would be in the guise of what I have come to call the "post-graduate training" of new faculty hires by multidisciplinary faculty who have an interest in preserving a liberal arts, core text tradition on their campus.

New Ph.D.'s are by definition singularly focused upon the one specialty they have cultivated. They come to institutions of liberal education usually with little experience in teaching liberal arts and less in judging its achievement in four-year baccalaureate students. No better venue for a re-introduction to instruments of assessing liberal education could be developed than the mentoring of new faculty be senior faculty through the careful reading of such works from the liberal arts traditions as a way to discuss and prepare faculty to assess the education of their students.

In developing a telescope Galileo wrote, "it is necessary to prepare quite a perfect telescope, which will show all the objects bright, distinct, and free from haziness … Unless the instrument is of this kind, it will be vain to attempt to observe." Galileo was as careful as he could be, but he knew that the telescope was not the issue; rather he was engaged in contributing to "true philosophy [and] the first steps of important contemplations" (31). Let us begin to construct our instruments in this spirit.

Postscript, 2020:

Galileo's use of dialectical topics in shaping his book and scientific discovery is discussed in Chapter 7 of *Invention*, along with others who used the liberal arts to construct new sciences. An elaborate, persistent, combinatoric use of the topics Galileo employs develops the whole book. The nearest-farthest, fixed-moving, order-reorder (alignment) the paper above opens with only explore the book's framework, but the book begins with the moon discussed through the dialectical common places of whole/part, light/dark, bounded/unbounded and so forth. As such, *The Starry Messenger* stands as an exemplar of how to build a physical, yet dialectical argument.

Works Cited

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